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Parallel computing for numerical calculations of step-index optical fibers eigenmodes by collocation method

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Abstract

© 2014 IEEE. We study natural modes of weakly guiding optical fibers. The original problem is reduced to a nonlinear nonselfadjoint spectral problem for the set of weakly singular boundary integral equations. The integral operator is approximated by collocation method. We propose to use the singular value decomposition of the collocation method's matrix for the initial approximation of eigenvalues. We implement parallel computing technologies (OpenMP and MPI) using a compact supercomputer.

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